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BANDING BATS

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[*Plates 4–5*]

The interesting article by Mr. A. B. Howell on "Some California Experiences with Bat Roosts" in the August number (1920) of the Journal inspires me to put on record a few observations that I have made on the bats in central New York, and a recent attempt that I have been making to mark individual bats with the aluminum bands of the American Bird Banding Association.

Seven species of bats are known to occur at Ithaca, New York, five of which are common and widespread. The hoary bat, *Nycteris cinerea*, is known only as a migratory species from a few specimens taken during October, and the Say's bat, *Myotis subulatus*, has been found but twice, July 2, 1904, and June 11, 1914. Of the others, the large brown bat, *Eptesicus fuscus*, and the small brown bat, *Myotis lucifugus*, are abundant about buildings, the latter being the more common. The other three, *Nycteris borealis*, the red bat, *Lasionycteris noctivagans*, the silvery-haired bat, and *Pipistrellus subflavus*, the pipistrelle bat, usually roost about trees or in crannies in the rocky sides of the gorges. The pipistrelles, however, frequently assemble in dark corners of buildings along the edges of the ravines.

The only ones I have found roosting in colonies are the little brown and the pipistrelle, the former occurring during the breeding season in colonies often of several hundreds, in dark attics, cupolas, etc., while the latter usually roost in small clusters. The accompanying photograph shows a cluster of 18, the largest I have seen.

On June 24, 1916, a neighbor, Mrs. Willard Austen, living close to Fall Creek gorge, informed me that some bats had been roosting in a

dark corner of her porch for some time and were making a nuisance of themselves by soiling the floor. She wished me to do away with them. Upon examination I found four female pipistrelles hanging in the darkest corner of the ceiling of the porch, which was partially shut in, in their characteristic tight cluster. Mrs. Austen informed me that they had been there the previous summer and that efforts to dislodge them by turning the hose on them, and poking them with brooms, were only temporarily successful, as they always returned the next night. This interested me and I wished to determine whether it was always the same bats that came back in spite of the disturbance or whether this porch was a roosting place known to many bats. Accordingly I ascended to their retreat and picked them off without their making any effort to fly. It was at this time I discovered that they were females carrying large embryos and I surmised that they had come here to have their young. I then took four of the smallest size bands of the American Bird Banding Association and placed them on their legs, taking care not to close them completely, but pinching them on tightly enough so that they would not come off. I then carried the bats three blocks to my home where after observing them for a time, I released them.

Mrs. Austen promised to inform me if the bats returned but as I never heard from her, the incident was forgotten until three years later, June 29, 1919, when she telephoned me that the bats had again been annoying her. She had invited a small boy to shoot them and when they picked up the dead bats they found the aluminum bands on their legs. I secured the bats of which there were again four, and three of them bore the bands that I had put on three years before. The numbers were 15899, 15901, 15902. Number 15900 had either been lost from the leg or else the bat had disappeared and its place been taken by another. The fourth bat was a female and all again were carrying large embryos. I inquired of Mrs. Austen whether the bats had been roosting on the porch during the two preceding summers but as she had been away each summer she was unable to inform me.

This curious incident of the same three, and probably the same four bats, staying together or returning to each other after three years had elapsed, reminded me of how little we know of their habits. Again, Mr. Howell, in his suggestive account of the California bats, states his belief that most of our bats are migratory, but the very fact that we cannot state so definitely shows how little we know about them. He speaks, for instance, of the large brown bat, *Eptesicus fuscus fuscus*,

as absent or very rare during winter in California, but with us it is the only species for which we have definite winter records. On several occasions I have seen them flying about in the day time during February or March, and, nearly every winter in January or February, one comes out of hiding and flies about the halls of the Zoology building at Cornell University. All these facts point to the need for further study of these interesting little beasts. The valuable results that are now being obtained by banding birds could no doubt be duplicated with bats if only enough persons would coöperate in the project of banding.

Illustrating the ease with which the banding can be done when the opportunity offers, I discovered this year a cluster of pipistrelles clinging to the gable of my barn; holding an insect net beneath them, I touched one of them with a stick and instantly the whole eighteen dropped into the net. This was on June 5 and I observed that sixteen of the number were females heavy with young. (The pipistrelles, in this locality, normally bear two young.) Each of these bats was banded as described above and liberated. Most of them returned to the barn sooner or later as the size of the cluster seemed to be about the same a few days later. They cling so closely to one another that it is impossible to count them and, at this time, close observation of them was made impractical by their roosting beside a large hornets' nest. Between the first and the middle of July, apparently, the young were brought forth but it was impossible to tell exactly. On the night of the fifteenth, however, two of the young were large enough to be left alone, for when I scanned the gable with the aid of a flash light, I discovered them hanging where the whole cluster had been during the day. On the twenty-fifth of the month the pipistrelles had moved away from the hornets' nest and the young seemed to be of good size so I again held the net beneath the cluster. This time I did not hold it quite so carefully and two of the old bats escaped. Ten adults and sixteen young were captured, however, and of these nine of the adults bore the bands that had been placed upon them the fifth of June. The bands were somewhat scratched, probably by the bats' teeth, but the skin showed no signs of abrasion by the bands. All the young but one could fly, and they were much darker and grayer than their parents. Nine were females and seven were males. If each of the twelve females had had two young and there were but sixteen left, it bespeaks a rather high mortality, doubtless at the stage when they were learning to fly. The young were banded and all were released. After that time there

was a cluster of varying size in the barn up to the last of August but by September first they had dispersed or found another roosting place. It will be interesting to learn if they come back next year, if exactly the same ones keep together, and if the young return with them or, if their numbers are not augmented by the young, as was the case with the four banded in 1916. Whether the pipistrelle migrates or hibernates I am unable to say from my own observations. They appear in the spring about the first of May about the time that the migratory silvery-haired bats appear, and I have seen them as late as the first of November.

While on the subject of bats I should like to describe a breeding colony of the small brown bat, *Myotis lucifugus*, which I examined a number of years ago, July 5, 1907. It was in the attic of a house in Homer, New York, 22 miles from Ithaca. The house was of brick with a flat tin roof sloping toward one end, the attic ranging from 18 inches to four feet in height. At the lower end of the roof the tin had become loosened from the brick, causing a crack of from half an inch to an inch in width through which the bats gained entrance. The bats congregated at the lower end of the attic hanging head downward from the roof trusses in large mats. They did not, however, cling to one another or form such dense clusters as do the pipistrelles. These masses were composed chiefly of adult females and young nearly grown. In one place where the roof was scarcely 18 inches from the floor, a large cuboidal space had been formed in the brick wall owing to the rotting away of a large joist. Here large numbers of the oldest young had congregated with a few females carrying young. The place most populous with bats, however, and the place where probably all of the young were born, was the space above the brick wall and below the roof between the trusses. Here the pregnant females had gathered in large numbers. From one of these spaces, thirty females were removed, all with small young or large embryos. Of course there was no pretense of a nest, the young being brought forth on the bare bricks. These were moist with urine but the excrement was apparently all ejected onto the floor where it had accumulated in piles several inches deep.

No female containing more than one embryo was found although some of the females were accompanied by two young of very different sizes. In fact there seemed to be three distinct sizes of young in the attic of which from thirty-two to thirty-six of each size were secured. The smallest had apparently been born but a short time. Of these four-

FIG. 1. ONE OF THE FEMALE PIPISTRELLES, SHOWING ATTACHMENT OF THE BAND. JUNE 5, 1920

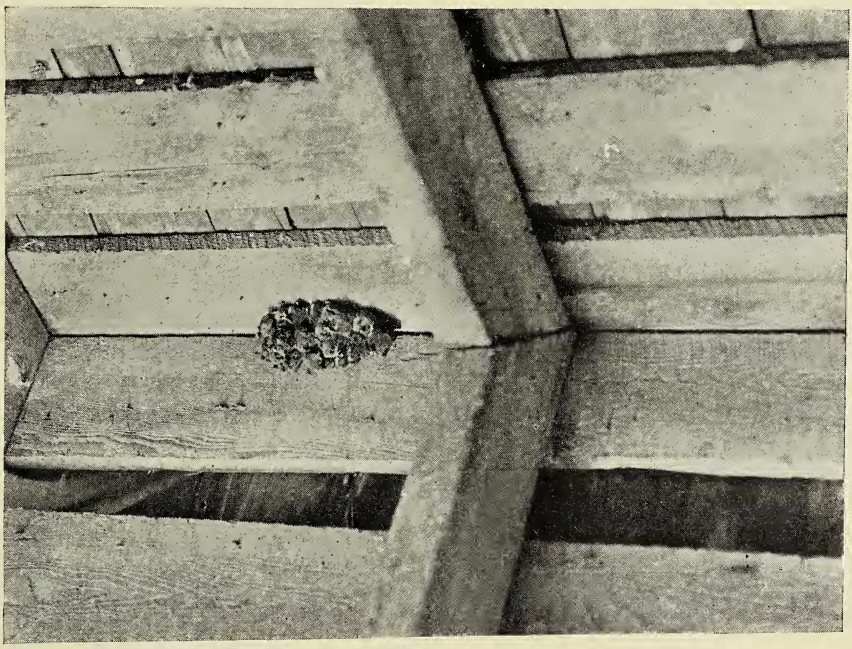

FIG. 2. A CLUSTER OF EIGHTEEN PIPISTRELLES HANGING TO THE GABLE OF THE BARN. JUNE 5, 1920

These bats were captured and banded